

## THE SPHAGNA OF AUSTRALIA AND TASMANIA.

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When the first part of "Census Muscorum Australiensium" (Watts & Whitelegge) was published (1902), much uncertainty existed regarding our Australian Sphagna. The recent publication (December, 1911) of Dr. C. Warnstorf's exhaustive monograph ("Sphagnologia Universalis"), in Engler's "Pflanzenreich," has, for the first time, made it possible to issue a satisfactory summary of the Sphagna of Australia and Tasmania.

"Sphagnologia Universalis" is Dr. Warnstorf's "Life-work," in what he rightly claims to be "one of the most difficult, as well as one of the most interesting" of plant-groups. The extreme difficulty of the group is evidenced by the large—one might well say, for the student, disconcerting—number of varieties and forms of species that Dr. Warnstorf has set up. The result of his studies is a bulky volume of 550 closely-packed pages—a striking tribute to the author's unremitting industry and patience in research.

In a summary, on p.36, the author gives the names of 21 species for Australia, and 9 for Tasmania: but I have found another Australian species (*S. Sullivani*) in the body of the book, and also Australian records (coll. by Watts on the Blue Mountains) of one of the Tasmanian species (*S. pseudo-rufescens*). The name "*S. commutatum*" in the summary, must be changed to "*S. novo-zealandicum*." Thus, 23 species are recorded for Australia; and to these must be added six for Tasmania (not yet recorded for the mainland): 29 in all.

In "Census Muscorum Austr.," 30 species are recorded for Australia and Tasmania, and 25 of these stand, with one or

two changes in nomenclature. Of the rest, *S. australe* and *S. macrocephalum* become merged in *S. antarcticum*, as varieties, and *S. Whiteleggei* in *S. subbicolor*.

Special interest, from the zoogeographic point of view, attaches to the fact that, out of a total of ten subsections, into which the Sphagna of the world are divided, four only are represented in Australasia (including New Zealand). Dr. Warnstorf, in his work, and also in a letter I have received from him, remarks upon the entire absence of the large subsection, the *Acutifolia*.

The following classified list is now submitted, on the basis of Dr. Warnstorf's work. Details of localities, etc., are mainly additional to those given in Census Musc. Austr., Part.i., pp.8-12.

## SPHAGNACEÆ.

### SPHAGNUM, Ehrh.

#### i. Sect., **Lithophlœa.**

##### Subsect. *Rigida.*

*S.* ANTARCTICUM Mitt. ; *S. australe* Mitt. ; *S. compactum* var. *ovatum* H.f.W. ; *S. confertum* Arch. et Mitt. ; *S. cristatum* Hpc.

TAS., Mt. Wellington, etc. : Archer, Oldfield, Weymouth, et al.

Var. AUSTRALE (Mitt.) Warnst., Sphag. Univ. ; *S. orthocladum* Burch. ; *S. Campbellianum* C.M. ; *S. falciformeum* C.M. ; *S. macro-rigidum* C.M. ; *S. erosum* Warnst. N.S.W., Govett's Leap, Blackheath, Katoomba Falls, etc. : Watts, April, 1903.—TAS., Mt. Wellington, etc. (See Census, sub *S. australe*).

Var. FLUCTUANS Warnst., Hedw.1890.

TAS., Huon Road. : Weymouth (n.2131-2).

Var. MACROCEPHALUM Warnst., as sp., Hedw.1893.

TAS., HUGH Rd. : Weymouth(n.2130).

Subsect. *Cuspidata*.

S. TRICHOPHYLLUM Warnst.

TAS.: Bastow.

S. SERRULATUM Warnst.

TAS., Zeehan railway,  $4\frac{1}{2}$  m. from Strahan, W. Coast: Weymouth(n.622-9).

S. SERRATUM Aust., in Bull. Torr. Bot. Club, 1877. Type limited to Europe and America.

Var. SERRULATUM (Schlieph., as var. of *S. cuspidatum*);

*S. Naumannii* C.M., in Engler's Bot. Jahrb. 1883.

Q. (? loc.): Naumann, Hb. Melb. and Berlin.

S. SERRATIFOLIUM Warnst.

N.S.W.: Watts.

S. BROTHERUSII Warnst.

N.S.W.: Watts (frequent).

Var. PLUMULOSUM Warnst., Sphag. Univ.

N.S.W., Shaw's Bay, Ballina, in dripping water below *S. drepanocladum*: Watts(n.4265).

S. SCORTECHINII C.M.

Q.: Rev. B. Scortechini.

S. DREPANOCLADUM Warnst.

N.S.W., Shaw's Bay, Ballina, and Wardell: Watts.

S. LANCIFOLIUM C.M. et Warnst.

N.S.W.: Whitelegge.

S. CUSPIDATUM Ehrh., in Pl. crypt.(1791), emend.

N.S.W. and Queensland.

S. WATTSII Warnst.

N.S.W., Richmond River (frequent); Govett's Leap, Blackheath: Watts. Also Blue Mountains: Whitelegge(n.422) Hb. Brotherus.

Var. MACROPHYLLUM Warnst., Sphag. Univ., p.272, Fig. 45 A.

N.S.W., Newcastle: Musson, Hb. Watts(n.4521).

Var. LEPTOCLADUM Warnst. *l.c.*

N.S.W., Richmond River: Watts (n.5606).

Subsect. *Subsecunda*.

S. LATICOMA C.M., in Herb. Berlin.

Vict.: Mrs. Martin.

S. NOVO-ZEALANDICUM Mitt.

N.S.W. Twofold Bay: White (n.63), Hb. Broth.; Cliffs, Manly (1895)), Edge of Freshwater lake, back of Seven Mile Beach, between Richmond River and Byron Bay (1901): Watts: [Warnst. Sphag.(1900) gave N.Z. only. In Sphag. Univ., he gives Australia, as above, and adds "v. Müller, Hb. Mitt.; Eckert, n.373, Hb. Brotherus." But he does not recognise it in Tas., except in var. *pulvinatum*.]

Var. MOLLE Warnst., Sphag. Univ.

N.S.W., Maroubra Bay: Whitelegge(n.435, Sept., 1891). [In Cens. Muscor., "*S. novo-zealandicum*."]

Var. PULVINATUM Warnst., Sphag. Univ.

Tas., Mt. Wellington, 1280 m.: Dies(n.6186), Hb. Berlin.

Var. COMMUTATUM Warnst., Sphag. Univ. *S. commutatum* Warnst., in Magy. bot. Lapok.(1902).

N.S.W., Richmond River, Lowe's Swamp, etc., near Ballina: Watts, 1901.

Var. LAXIFOLIUM Warnst., Sphag. Univ.

N.S.W., Richmond River: Watts.

Var. PAUCIPOROSUM Warnst., Sphag. Univ.

N.S.W., Richmond River: Watts.

S. DUBIOSUM Warnst.

S.A.: Miss Campbell(n.5), Hb. Broth.

S. SUBMOLLICULUM Warnst.

Tas.: Moore and Weymouth.

*S. SUBCONTORTUM* Hpe.

N.S.W.: Guilfoyle.

*S. COMOSUM* C.M.

N.S.W.: Whitelegge; Mayfield, near Nowra: Miss Monaghan; Tomerong, near Nowra: Watts.—VICT., Berwick: Robinson, Herb. Melb. and Berlin.

*S. MOLLICULUM* Mitt.; *S. Mossmannianum* C.M., in Hb. Kew.

TAS.: Archer, Oldfield; Herb. Kew. [Warnst., in a note under this species in *Sphag. Univ.*, says that specimens named *S. molliculum* Mitt., by C.M., in Hb. Berlin, belong to the *Uspidata*. This apparently applies to Whitelegge's specimens from Waterloo, N.S.W. See Census.]

*S. MOOREI* Warnst.

TAS.: Moore.

Var. *MACROPHYLLUM* Warnst., *Sphag. Univ.*

TAS., Port Esperance: Weymouth(n.1693).

*S. PSEUDO-RUFESCENS* Warnst.

TAS.: Weymouth, Watts, Miller (see the following varieties.)

Var. *FUSCO-RUFESCENS* Warnst., *Sphag. Univ.*

TAS., Mt. Wellington: Weymouth, Watts.—N.S.W., Blue Mountains: Watts.

f. *DICLADUM* Warnst., *l.c.*

N.S.W., Blue Mountains: Watts.

Var. *FLAVESCENS* Warnst., *l.c.*

TAS., Mt. Wellington: Watts, 1895.

Var. *VIRESCENS* Warnst., *l.c.*

N.S.W., Blue Mountains: Watts.

Var. *PALLENS* Warnst., *l.c.*

TAS., Port Esperance: Weymouth, Oyster Cove: Miller.—N.S.W., Blue Mountains: Watts.

*S. CYMBIFOLIOIDES* C.M., Bot. Zeit., 1851; *S. cymbophyllum* F.v.M.; Warnst., Hedw., 1891, Tables iii and v. TAS., Cheshunt: Archer; Port Esperance: Weymouth, Clennett (?).—VIC: Walter, Hb. Melb.—N.S.W., Green Cape: Mossman, Hb. Mitten; Parramatta: F.v.M.; . . . . Forsyth(n.71).

*S. SULLIVANI* C.M., in Hb. Berlin, Gen. M. p.103. Warnst., Sphag. Univ., p.427. VIC., Mt. William, Creek: Sullivan, Aug.'75(n.18).

ii. Sect. **Inophlœa.**

Subsect. *Cymbifolia.*

*S. MAXIMUM* Warnst.

TAS. (?loc.): Scott (n.7), Hb. Melb. and Berlin; Hb. Mitt. (n.5).

Var. *SQUARROSULUM* Warnst., in litt., 1899, Spag. Univ., p.459. (See also Hedw., 1891.)

N.S.W., Bellinger River ("Ballinger's River"), 1525 m. alt. Canon(n.2), Hb. Broth.

*S. CYMBIFOLIUM* Ehrh., emend. *S. Wilcoxi* C.M., Flora, 1887.

TAS.: Weymouth(n.2120) [The only Tasmanian record given by Warnst.]—N.S.W., Clarence River: Wilcox; Richmond River: Watts(n.392 and 1025).

[Formerly *S. cymbifolium* was returned frequently for Austr. and Tas. specimens (see Census, Part i.), but Warnst. now recognises it rarely. In his summary of Tas. species, the name does not occur, though on p.463 there is a Tas. record. On p.34, it is ascribed to "Europe N. America and Japan" alone.]

*S. SUBBICOLOR* Hpe., in Flora, '80; *S. centrale* Jens.; *S. Whiteleggei* C.M., in Fl. '87; *S. leionotum* C.M., *l.c.*; *S. pachycladum* C.M., in Hb. Geeheeb.

Q.: Karsten(n.62), Warburg(n.1).—N.S.W., Mt. Kosciusko: Maiden & Forsyth(n.154 and 181); Mt. Wilson: Gregson(n.100); . . . Forsyth(n.159); Whitelegge, Watts (Blue Mountains and Yarrangobilly district).—VIC.: Flora M. Martin(n.724).—S.A.: Miss Campbell.—TAS., Mt. Wellington: Watts, Diels, Hazell, Kirwan, Weymouth.

*S. GRANDIFOLIUM* Warnst.

N.S.W. Richmond River: Watts.

Var. *BRACHYCLADUM* Warnst., Sphag. Univ.

N.S.W. Richmond River: Watts.

Var. *LAXIFOLIUM* Warnst., *l.c.*

N.S.W., Richmond River: Watts(n.4208).

Var. *DENSUM* Warnst., *l.c.*

N.S.W. Richmond River: Watts.

*S. MEDIUM* Limpr., Bot. Centralbl., 1881.

N.S.W., above Gordon Falls, Leura: Watts, Apl., '03.

*S. DECIPIENS* Warnst., Hedw., 1907, and Sphag. Univ.

N.S.W., Govett's Leap, Blackheath: Watts, Apl., '03.

Var. *ROTUNDATUM* Warnst., *l.c.*

N.S.W., *idem.*

Var. *OBOVATUM* Warnst., *l.c.*

f. *ANOCCLADUM* Warnst., *l.c.*

f. *SQUARROSULUM* Warnst., *l.c.*

N.S.W., *idem.*

*S. WARDELLENSE* Warnst., Hedw., 1907, Sphag. Univ.

N.S.W., near Wardell, Richmond River: Watts.

The new species in this list, which I have had the honour of discovering, are: *S. Brotherusii*, *S. drepanocladum*, *S. decipiens*, *S. grandifolium*, *S. serratifolium*, *S. Wardellense*, and *S. Wattsii*.